

e) applying the tone scale function to the full resolution digital image to produce a tone scale adjusted full resolution digital image.

5. The method claimed in claim 1, wherein the image sensing device is a color image sensing device having differently colored photosites for producing color pixel values and wherein the slow pixel values from only one color of photosite are used to generate the tone scale function.

6. The method claimed in claim 5, wherein the different colors are red, green, and blue and wherein only green pixel values are used to generate the tone scale function.

7. The method claimed in claim 1, wherein the image sensing device is a color image sensing device having differently colored photosites for producing color pixel values and further comprising the step of:

d) constructing slow luminance pixel values from the different colored slow pixel values; and

e) using the slow luminance pixel values to generate the tone scale function.

8. The method claimed in claim 1, further comprising the steps of:

d) forming a paxelized digital image from the slow pixel values;

and

e) using the paxelized digital image to generate the tone scale function.

9. The method claimed in claim 4, further comprising the step of applying a spatial filter to the full resolution digital image.

10. The method claimed in claim 1, further comprising the steps of:

d) generating a low resolution digital image from the sparsely sampled high resolution digital image;

- e) applying the tone scale function to the low resolution digital image to form a tone scale modified low resolution digital image;
- f) displaying the tone scale modified low resolution digital image;
- g) specifying a desired tone scale adjustment of modified low resolution digital image; and
- h) employing the specified tone scale adjustment to generate an adjusted tone scale function.

11. The method claimed in claim 1, wherein the method is performed in a digital camera.

12. The method claimed in claim 1, wherein the image sensing device is a color image sensing device having differently colored photosites for producing color pixel values and wherein a tone scale function is generated for each color.

13. The method claimed in claim 12, further comprising the steps of:

- d) generating a full resolution digital image from the sparsely sampled high resolution digital image; and
- e) applying the tone scale functions to the full resolution digital image to produce a tone scale adjusted full resolution digital image.

14. A method of generating a tone scale function for a sparsely sampled extended dynamic range digital image, comprising the steps of:

- a) providing a sparsely sampled extended dynamic range image sensing device having fast photosites with a predetermined response to light exposure interspersed with slow photosites with a slower response to the same light exposure;

18. The method claimed in claim 14, wherein the image sensing device is a color image sensing device having differently colored photosites for

producing color pixel values and wherein the pixel values from only one color of photosite are used to generate the tone scale function.

19. The method claimed in claim 18, wherein the different colors are red, green, and blue and wherein only green pixel values are used to generate the tone scale function.

20. The method claimed in claim 14, wherein the image sensing device is a color image sensing device having differently colored photosites for producing color pixel values and further comprising the step of:

d) constructing luminance pixel values from the different colored pixel values, and

e) using the luminance pixel values to generate the tone scale function.

21. The method claimed in claim 14, further comprising the steps of:

d) forming a paxelized digital image from the pixel values; and

e) using the paxelized digital image to generate the tone scale function.

22. The method claimed in claim 17, further comprising the step of applying a spatial filter to the full resolution digital image.

23. The method claimed in claim 14, further comprising the steps of:

d) generating a low resolution digital image from the sparsely sampled high resolution digital image;

e) applying the tone scale function to the low resolution digital image to form a tone scale modified low resolution digital image;

- f) displaying the tone scale modified low resolution digital image;
- g) specifying a desired tone scale adjustment of modified low resolution digital image; and
- h) employing the specified tone scale adjustment to generate an adjusted tone scale function.

24. The method claimed in claim 14, wherein the method is performed in a digital camera.

25. The method claimed in claim 14, wherein the image sensing device is a color image sensing device having differently colored photosites for producing color pixel values and wherein a tone scale function is generated for each color.

26. The method claimed in claim 25, further comprising the steps of:

- d) generating a full resolution digital image from the sparsely sampled high resolution digital image; and
- e) applying the tone scale functions to the full resolution digital image to produce a tone scale adjusted full resolution digital image.

27. A system for generating a tone scale function for a sparsely sampled extended dynamic range digital image, comprising:

- a) a sparsely sampled extended dynamic range image sensing device having fast photosites with a predetermined response to light exposure interspersed with slow photosites with a slower response to the same light exposure for producing a sparsely sampled high resolution digital image having fast pixel values produced by the fast photosites and slow pixel values produced by the slow photosites; and

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c) means for generating the tone scale function using only slow pixel values from the sparsely sampled high resolution digital image.

28. The system claimed in claim 27, further comprising:

c) means for applying the tone scale function to the sparsely sampled high resolution digital image to produce a tone scale adjusted sparsely sampled high resolution digital image.

29. The system claimed in claim 28, further comprising:

d) means for generating a full resolution digital image from the tone scale adjusted sparsely sampled high resolution digital image to produce a tone scale adjusted full resolution digital image.

30. The system claimed in claim 27, further comprising:

c) means for generating a full resolution digital image from the sparsely sampled high resolution digital image; and

d) means for applying the tone scale function to the full resolution digital image to produce a tone scale adjusted full resolution digital image.

31. The system claimed in claim 27, wherein the image sensing device is a color image sensing device having differently colored photosites for producing color pixel values and wherein the slow pixel values from only one color of photosite are used to generate the tone scale function.

32. The system claimed in claim 31, wherein the different colors are red, green, and blue and wherein only green pixel values are used to generate the tone scale function.

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c) means for constructing slow luminance pixel values from the different colored slow pixel values; and

34. The system claimed in claim 27, further comprising:

d) means for using the paxelized digital image to generate the tone scale function.

36. The system claimed in claim 27, further comprising:

d) means for applying the tone scale function to the low resolution digital image to form a tone scale modified low resolution digital image;

f) means for specifying a desired tone scale adjustment of modified low resolution digital image; and

g) means for employing the specified tone scale adjustment to generate an adjusted tone scale function.



37. The system claimed in claim 27, wherein the system is in a digital camera.

38. The system claimed in claim 27, wherein the image sensing device is a color image sensing device having differently colored photosites for producing color pixel values and wherein a tone scale function is generated for each color.

39. The system claimed in claim 38, further comprising:

c) means for generating a full resolution digital image from the sparsely sampled high resolution digital image; and

d) means for applying the tone scale functions to the full resolution digital image to produce a tone scale adjusted full resolution digital image.

40. A system for generating a tone scale function for a sparsely sampled extended dynamic range digital image, comprising:

a) a sparsely sampled extended dynamic range image sensing device having fast photosites with a predetermined response to light exposure interspersed with slow photosites with a slower response to the same light exposure for producing a sparsely sampled high resolution digital image having fast pixel values produced by the fast photosites and slow pixel values produced by the slow photosites;

b) means for analyzing the fast pixel values for saturation; and

c) means for generating the tone scale function using only slow pixel values from the sparsely sampled high resolution digital image if saturation is present in the fast pixel values, otherwise, using only fast pixel values.

41. The system claimed in claim 40, further comprising:

d) means for applying the tone scale function to the sparsely

e) means for generating a full resolution digital image from the

usted sparsely sampled high resolution digital image to produce a

d) means for generating a full resolution digital image from the

led high resolution digital image; and

e) means for applying the tone scale function to the full resolution

44. The system claimed in claim 40, wherein the image sensing

45. The system claimed in claim 44, wherein the different colors

46. The system claimed in claim 40, wherein the image sensing

d) means for constructing luminance pixel values from the different

e) means for using the luminance pixel values to generate the tone scale function.

47. The system claimed in claim 40, further comprising:

d) means for forming a paxelized digital image from the pixel values; and

e) means for using the paxelized digital image to generate the tone scale function.

48. The system claimed in claim 43, further comprising means for applying a spatial filter to the full resolution digital image.

49. The system claimed in claim 40, further comprising :

d) means for generating a low resolution digital image from the sparsely sampled high resolution digital image;

e) means for applying the tone scale function to the low resolution digital image to form a tone scale modified low resolution digital image;

f) means for displaying the tone scale modified low resolution digital image;

g) means for specifying a desired tone scale adjustment of modified low resolution digital image; and

h) means for employing the specified tone scale adjustment to generate an adjusted tone scale function.

50. The system claimed in claim 40, wherein the system is in a digital camera.

51. The system claimed in claim 40, wherein the image sensing device is a color image sensing device having differently colored photosites for

producing color pixel values and wherein a tone scale function is generated for each color.

52. The system claimed in claim 51, further comprising:

d) means for generating a full resolution digital image from the sparsely sampled high resolution digital image; and

e) means for applying the tone scale functions to the full resolution digital image to produce a tone scale adjusted full resolution digital image.

53. A computer program product for performing the method of claim 1.

54. A computer program product for performing the method of claim 2.

55. A computer program product for performing the method of claim 3.

56. A computer program product for performing the method of claim 4.

57. A computer program product for performing the method of claim 5.

58. A computer program product for performing the method of claim 6.

59. A computer program product for performing the method of claim 7.

69. A computer program product for performing the method of claim 17.

78. A computer program product for performing the method of claim 26.